J. ent. Soc. sth. Afr. 1976
Vol. 39, No. 1, pp. 87–96

The African genus *Hyalonysius* Slater (Hemiptera-Heteroptera: Lygaeidae)*

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Hyalonysius, a member of the lygaeid subfamily Orsillinae, was proposed by Slater (1962) for two South African species (of which one had been described in the genus *Nysius* by Distant in 1904) and one West African species. Ashlock (1967), revising the generic classification of the Orsillinae, placed *Hyalonysius* in the tribe Orsillini. Two new species of *Hyalonysius* from South Africa, *fumosus* and *gilvus*, found by Slater and his group in field-work in South Africa and during a visit to the British Museum (Natural History), are described in this paper. The first biological observations on members of the genus are also included.

INTRODUCTION

The Orsillinae are generally small to medium-sized lygaeids, most often light brown with dark spots on the femora. The subfamily shares several characteristics with the Lygaeinae, although lygaeines are usually more brightly coloured.These similarities include dorsally placed abdominal spiracles, straight ventral abdominal sutures, and a lack of punctation on the corium. Orsillines may be distinguished from lygaeines by their apically sinuate corial margins and by their overlapping claval apices. The Orsillinae are unique in the Lygaeidae in having the last abdominal tergum in males greatly exceeding the connexivum posteriorly.

Like most Lygaeidae, orsillines eat seeds, often feeding on ripening or mature seeds on the plant, although they are sometimes found in large numbers on the ground under plants. Some species, including a few that are of economic importance, feed on other parts of plants as well. *Nysius raphanus* Howard has done serious damage to alfalfa and other crops in North America, *Nysius caledoniae* Distant once caused an 80% loss in

* This work was supported by grants from the University of Kansas General Research Fund, the University of Connecticut Research Foundation (to P.D.A.), and the National Science Foundation (to J.A.S.).

vanda orchid crop in Hawaii (Ashlock 1967), and *Nysius huttoni* White damages cultivated cruciferous seedlings in New Zealand as well as wheat in the milk ripe stage, seriously lowering the quality of flour milled from the grain (Eyles & Ashlock 1969). *Nysius binotatus* (Germar), and perhaps *N. natalensis* Evans, have caused injury to crops in South Africa, including sunflower seed heads (see Slater 1964: 65–67 for references).

The cosmopolitan Orsillinae contains over 200 species in 27 genera and 4 tribes. The group reaches its greatest development in the Hawaiian Islands, where about 80 species are found, arranged in 8 genera. The African fauna south of the Sahara is, by comparison, quite small, with 15 recorded species (including the new ones described here) in 4 genera and 2 tribes.

One of these tribes, the Nysiini, contains the cosmopolitan genus *Nysius* (8 African species) and the monotypic *Oreonysius,* a flightless, beetle-like species from Tanzania, which may be a true *Nysius*. Several flightless and beetle-like *Nysius* species have been collected since Usinger (1952) described *Oreonysius*.

The other tribe, the Orsillini, contains, besides *Hyalonysius*, the genus *Camptocoris* with 4 species. Only one species of *Camptocoris* is recorded from the Ethiopian region. Slater and his group collected this species from South Africa as well as two new *Camptocoris*.

KEY TO GENERA OF ORSILLINAE

The following key will separate the genera of Orsillinae found in Africa south of the Sahara.

1. Costal margin of hemelytron straight and paralleling vein R + M no farther than level of apex of scutellum; connexivum not exposed lateral to corium ..... NYSIINI 2
— Costal margin of hemelytron straight, at least to level of apex of claval commissure, and paralleling vein R + M at least to level of apex of scutellum; connexivum often exposed lateral to corium ..... ORSILLINI 3
2. Beetle-like, corium convex, extending to apex of hemelytron; membrane reduced, narrow, 4½ times as long as wide; claval commissure at least as long as scutellum; Mt. Kilimanjaro, Tanzania ..... **Oreonysius**
— Not beetle-like; corium not reaching apex of hemelytron; membrane not reduced or narrow; claval commissure shorter than scutellum ..... **Nysius**
3. Scutellum acute apically; mesopleuron appearing to overlap propleuron (fig. 1a); apical antennal segment of male not longer than pronotum ..... **Hyalonysius**
— Scutellum rounded apically; mesopleuron appearing to butt propleuron; apical antennal segment of male longer than median length of pronotum ..... **Camptocoris**

THE GENUS *HYALONYSIUS*

The genus *Hyalonysius* is for the most part confined to South Africa. A single specimen of the most widely collected South African species, *H. pallidomaculatus,* was collected in Zaïre (Congo), and another species, *H. ashlocki* Slater, was described and is known only from two specimens from Liberia. These distributions indicate that more species may be found when tropical Africa is more fully explored.

The genus takes its name from the hyaline clavus and corium, a character unique in the African orsilline fauna but approached in unrelated orsillines from South America and elsewhere. The most striking feature of the genus *Hyalonysius* is on the mesopleuron, which appears to overlap the propleuron (fig. 1a). This character is also unique to *Hyalonysius* in the African orsilline fauna but is shared by several other

orsilline genera elsewhere; in Australia by *Austronysius* Ashlock and *Eurynysius* Ashlock; in South America by *Aborsillus* Barber; and in North America by *Belonochilus* Uhler. In all other orsillines (and all other Lygaeidae for that matter) the mesopleuron and propleuron appear to butt together, though actually the propleuron overlaps the mesopleuron. Since the apparently overlapping mesopleuron is unique to these few genera, it provides strong evidence that they form a holophyletic group (see Ashlock 1971; 1972) sharing an ancestor not shared with any other group. From what little is known of the biology of these genera (*Belonochilus* in North America, *Austronysius* in Australia, and *Hyalonysius* in South Africa) these forms may live on trees or shrubs rather than on herbs, as do most other continental Orsillinae. Because these five genera are a predominantly southern hemisphere group, the distribution may be a result of continental drift. A careful cladistic analysis of the Orsillini will be required, however, to establish this possibility (see Ashlock 1974).

Useful characters are often found on the aedeagus of orsillines. The aedeagus of a species of *Hyalonysius*, *H. pallidomaculatus*, is figured here for the first time (fig. 1b). It is most similar to that of the South American *Aborsillus insignis* Barber (Ashlock 1967, fig. 3a) and clearly illustrates the distal pigmented band on the conjunctiva and the basal pigmented lobe on the vesica characteristic of most orsillines. The insert to fig. 1b, which shows the opposite side of the vesica, demonstrates the reversal in direction

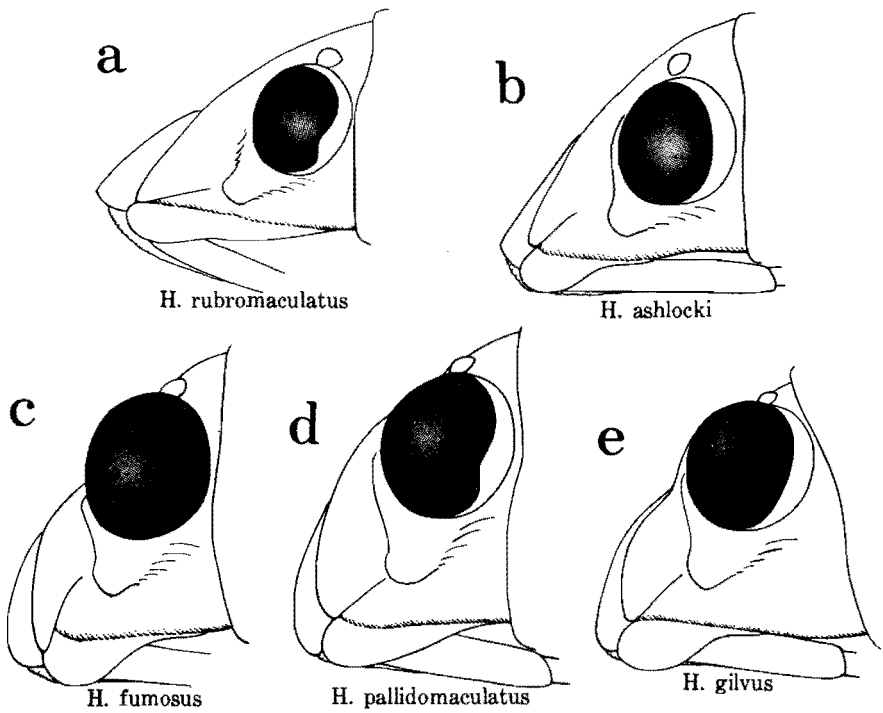

Fig. 1. *Hyalonysius* species. 1a–e. Heads, lateral views.

of the vesical sperm duct found in the terminal versical enlargement of most members of the tribe Orsillini.

Useful characters are also plentiful on the spermatheca. The rather simple spermatheca in *Hyalonysius* (fig. 1c, d) approaches that of the North American *Belonochilus numenius* (Say) (Ashlock 1967, fig. 8b). The figures of the spermathecae of the two new species of *Hyalonysius* (figs 1c, d) clearly show specific differences. Ashlock (1967, fig. 14f) figured the spermatheca of *H. pallidomaculatus* which, while distinctive, is most like that of *H. gilvus*. It is unfortunate we have so few specimens of *H. rubromaculatus* and *H. ashlocki*, for the spermathecae may further demonstrate that these two elongate species with long labia are a separate section of the genus.

The excellent dorsal views of the two new species (figs 3, 4) were drawn by Mrs Kathleen Schmidt of the University of Connecticut. *H. pallidomaculatus* was previously figured by Ashlock (1967, fig. 14e).

KEY TO SPECIES OF *HYALONYSIUS*

1. Relatively narrow, over 4,5 mm long; labium at least attaining third abdominal segment; third labial segment extending between or exceeding posterior coxae 2
— Relatively stout, less than 4 mm long; labium reaching or slightly exceeding posterior coxae, third segment not or at most reaching anterior margin of posterior coxae 3
2. Bucculae evenly tapered to base of head (fig. 2a); apex of corium with a dull red spot ..... **rubromaculatus**
— Bucculae more abruptly tapered, not visible near base of head (fig. 2b); apex of corium with a brilliant orange spot ..... **ashlocki**
3. Dark brown, hyaline portion of corium distinctly pigmented ..... **fumosus**
— Pale yellowish brown, hyaline portion of corium without pigmentation 4
4. Head, pronotum, and scutellum usually with prominent dark markings, humeral angles always with a black or dark brown spot; bucculae evenly tapered and evident in side view to near base of head (fig. 2d) ..... **pallidomaculatus**
— Head, pronotum, and scutellum with sparse (if any) dark markings, humeral angles without a dark spot; bucculae tapered abruptly, disappearing in side view well before base of head (fig. 2e) ..... **gilvus**

Hyalonysius ashlocki Slater, fig. 2b

Hyalonysius ashlocki Slater, 1962: 133–134.

No additional specimens of this beautifully marked elongate species have been collected or located in museum collections. The holotype male (U.S. National Museum) and the female paratype (Slater collection) were collected in Suakoko, Liberia. No host information is available, but the elongate labium suggests that, like its nearest relative *H. rubromaculatus*, *H. ashlocki* may utilize some species of *Ficus* as a host.

Hyalonysius rubromaculatus (Distant), fig. 1a

Nysius rubromaculatus Distant, 1904: 352–353.
Hyalonysius rubromaculatus, Slater, 1962: 132–133.

The only specimen of this species taken by the Slater group is a single female (6 km S Komatipoort, Transvaal, 25/26.iii.68) collected on a large specimen of *Ficus sycomorus* growing on the flood plain immediately adjacent to the Komati River. The specimen was beaten either from fig "fruits" or from adjacent twigs. While this single record does not establish *Ficus* as the host plant, the species' elongate labium is

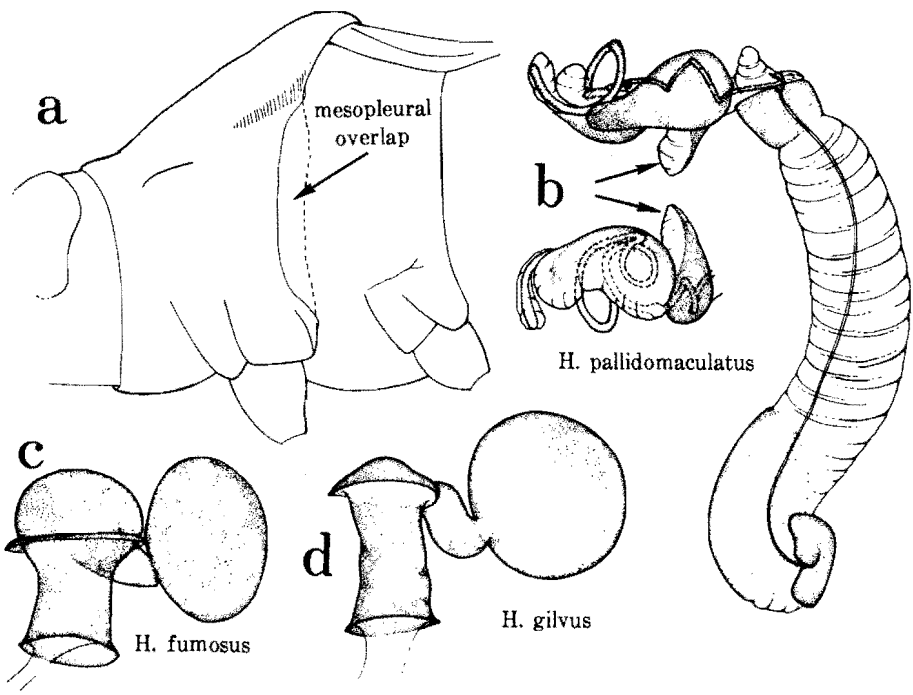

Fig. 2. *Hyalonysius* species. 2a. *H. pallidomaculatus*, lateral view of the pro- and mesothorax. 2b. *H. pallidomaculatus*, inflated aedeagus. 2c–d. Spermathecae.

significant, as many of the heterogastrine and other lygaeid fig-feeders also possess unusually elongate beaks, which appear to be an adaptation for feeding on figs on the tree (Slater 1971, 1972b).

The only other specimen of this species known is Distant's female holotype [British Museum (Natural History), Shilouvane, Zoutpansberg, N. Transvaal, col. H. A. Junod, 1903].

Hyalonysius fumosus spec. nov., figs 1c, 2c, 3

Head moderately rounded between eyes, moderately punctate, sparsely covered with flattened appressed hairs, carina on ocellar-antenniferous tubercle not prominent, basally straight, eye prominent, not higher than vertex. Length 0,76; width 0,98; antiocular length 0,34; eye length 0,26; eye width 0,18; interocular space 0,62 (measurements all mm). Buccula widest anteriorly, abruptly narrowing to level of antenniferous tubercle, then narrowly tapered to about level of hind margin of eye; labium extending between hind coxae, first segment just reaching base of head, apex of third segment reaching between mesocoxae, segment lengths from base: 0,50; 0,46; 0,50; 0,36; antenna with sparse semierect pilosity, first segment not exceeding clypeus, segment lengths from base: 0,12; 0,44; 0,40; 0,56.

Pronotum clothed with inconspicuous appressed hairs, moderately punctate, distance between punctures less than equal to diameter of puncture, midline impunctate, lateral margins rounded anteriorly and posteriorly, straight for greater part, length 0,78; width 1,36. Scutellum with vestiture like pronotum, punctures more closely spaced but less conspicuous, Y-shaped carina with transverse arms widely spread, not prominent, medial arm prominent; length 0,60; width 0,78.

Hemelytra slightly exceeding abdomen, clavus and corium very sparsely clothed with fine appressed hairs, most evident on opaque apex of costal margin, veins evident, branch R of R + M obscured in opaque area; length of claval commissure 0,38; length of corium 1,80; membrane slightly wrinkled longitudinally, veins transparent, basal length to level of corial apex 0,82; apical length from level of corial apex 0,90. Length: holotype male 3,89 (male mean length 3,99, range 3,83–4,17; female mean length 4,19, range 4,11–4,28 mm).

Colour. Head reddish brown, clypeus, midline stripe of vertex, and margin of eyes paler, black posteriorly and medial to carina on ocellar-antenniferous tubercle

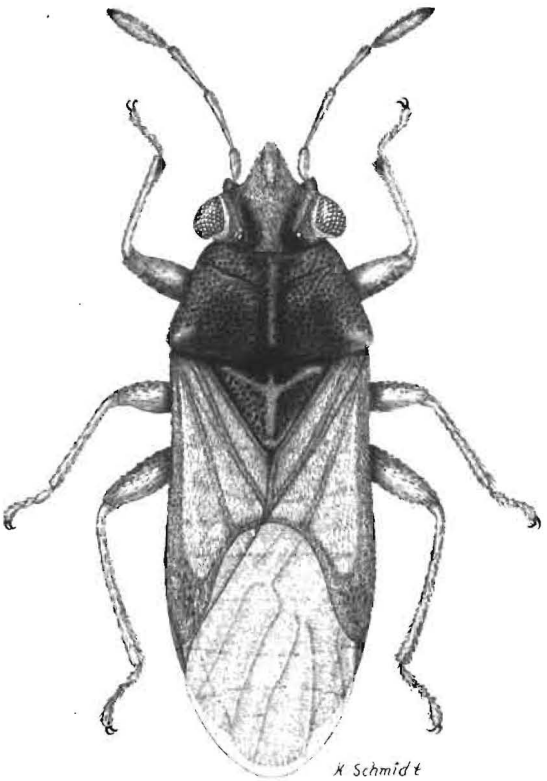

Fig. 3. *Hyalonysius fumosus* spec. nov. Dorsal view.

(except midline and jugae); antennae, bucculae, labium yellowish brown, apical segment of labium black. Pronotum and scutellum reddish brown, pronotum darker antero-medially except midline and scutellum with longitudinal carina prominently pale yellow brown. Hemelytra with hyaline portions of clavus and corium distinctly coloured a smoky reddish brown, veins and area lateral to vein R + M tinged with red, membrane coloured like corial hyaline areas, vestiture nearly white, inconspicuous. Connexiva yellowish brown. Legs pale yellowish brown, with typical orsilline femoral spots inconspicuous light brown. Ventor reddish brown, acetabulae and scent gland auricle pale yellowish.

MATERIAL EXAMINED. Holotype male, SOUTH AFRICA, Cape Province: Caledon Botanical Gardens, adults on *Cunnonia capensis* L., 1 Feb. 1968 (T. Schuh, J. A. & S. Slater, M. Sweet). In National Collection of Insects, Pretoria. Paratypes: 18 males, 15 females, same data as holotype. In the authors' collections.

The Slater group collected the type series on *Cunnonia capensis* L. This was a 6 to 10 m tree growing along a flowing stream bed and bore a number of elongate white fuzzy flower stalks and many seed heads. The majority of the seed heads were green, but scattered over the tree at considerable distance from the ground were dry seed heads. All 34 specimens were collected only on these dry seed heads.

Hyalonysius pallidomaculatus Slater, figs 1a, b, 2d

Hyalonysius pallidomaculatus Slater, 1962: 132.

This, the type species of the genus *Hyalonysius,* is the most common and widespread species in the genus. On November 5 and 22, 1967, the Slater group collected a series of adults and nymphs on the dry seed heads of a large cultivated specimen of *Buddleia salvifolia* (L.) Lam. in the National Botanical Gardens, Pretoria. The plant was 5 to 7 m high, and the dry seed heads were well above the ground. The adult bugs were very active and flew readily when disturbed. On December 13, adults were taken on the same host in a garden 8 km north of Louis Trichardt at the Mountain Inn at 1 500 m in the Zoutpansberg Range.

Fifth instar: (alcohol), Pretoria National Botanical Gardens, 5-XI-67 (T. Schuh, J. A. & S. Slater). Elliptical ovoid; general coloration pale testaceous including legs with contrasting darker reticulated areas laterally on head and pronotum, near distal ends of mesothoracic wing pads, laterally on metanotum and first abdominal tergum and near antero-lateral angles of scutellum, much more strongly reticulated on thoracic pleura and weakly so midway between meson and lateral margin of abdominal sterna; antennae tinged with dull reddish throughout; posterior margin of each abdominal tergum marked with a very narrow inconspicuous reddish or brown stripe and usually a short brown transverse dash in middle of each tergum just within connexivum and round brown areas circling spiracles on connexivum, paired orifices of scent glands with a conspicuous black marking but connecting stripe only slightly blackened and appearing little differentiated from remainder of intersegmental boundary; head uniformly pale below, thoracic pleura and lateral areas of abdominal sterna strongly dark brown reticulated, fourth labial segment and distal end of second tarsal segment darkened (in some specimens the third labial segment and the entire second tarsal segment may be dark brown).

Head short, broad, slightly declivent anteriorly, tylus extending to middle of second antennal segment, moderately convex across vertex, head length 0,50; width

0,86; interocular space 0,54; pronotum broad, short, much wider than long, depressed in area of calli stripe, posterior margin shallowly concave, lateral margins narrowly carinate, pronotum length 0,44; width 1,16; scutellum length 0,60; width 0,62; wing pads length 0,86; abdomen length 1,30 (approx.); labium extending to anterior abdominal sternum, length labial segments I 0,44; II 0,44; III 0,46; IV 0,36; antennae terete but short and stout relative to condition in adult, length antennal segments I 0,14; II 0,27; III 0,26; IV 0,37; total length 2,0 (approx., abdomen shrivelled). (Measurements: mm.)

One of the five nymphs available for study is much paler than the others although not obviously teneral. In this specimen the dark brown reticulated areas are almost absent on the wing pads, pleural regions, and abdomen. The nymphs of *H. pallidomaculatus* differ from nymphs of *Camptocoris* and from African *Nysius* nymphs we have examined in their complete lack of longitudinal brown stripes on the head, pronotum, and wing pads.

MATERIAL EXAMINED. SOUTH AFRICA, Cape Province: 1 male, 1 female (paratypes), Tradouw Pass, 13.i.32 (R. E. Turner); 1 male, Grootvatersbosch, 22 km N Heidelburg, 5.ii.68 (J. A. & S. Slater, T. Schuh, M. H. Sweet); 1 male, 2 females, 3 km S Goukamma, Knysna, 8.ii.68 (same); 12 males, 11 females, Grahamstown, 7.xii.66 (C. D. Michener); 1 male, 1 female, Mossel Bay, x.21 (R. E. Turner); 1 male, same data but vi.21; 1 female, same data but ix.24; 2 males, 1 female, Somerset East, ix.30 (R. E. Turner); 1 male, same data but 23/31.xii.30; 1 female, Oudtshoorn, 29.x.49 (B. Malkin). *Natal:* 1 female, Weenen, i.25 (H. P. Thomasset). *Transvaal:* 3 males, 1 female, National Botanical Gardens, Pretoria, on *Buddleia salvifolia* (L.) Lam., 5.xi.67 (J. A. & S. Slater, T. Schuh); 13 males, 8 females, same data but 22.xi.67; 1 male, 1 female, Zoutpansberg, 8 km N Louis Trichardt, 1 350 m, 13.xii.67 (J. A. & S. Slater, T. Schuh, M. H. Sweet); 1 male, Rustenburg, 7/14.xi.67 (A. L. Capener). *Additional published records:* Slater (1962): *Cape Province*, Katberg, 1 200 m, Swellendam, Robertson Pass nr Mossel Bay; *Transvaal*, Johannesburg (type locality). Slater (1972a): *Zaïre* (Congo): Upemba National Park, Lusinga. Slater's (1962) paratype of this species from Ceres, Cape Province, April, 1925 (R. E. Turner) should be assigned to *H. gilvus*, new species.

Hyalonysius gilvus spec. nov., figs 1d, 2e, 4

Head nearly flat between eyes, lightly punctate, densely covered with flattened appressed hairs, carina on ocellar-antenniferous tubercle not prominent, basally straight; eye prominent, not higher than vertex; length 0,72; width 1,04; antiocular length 0,34; eye length 0,32; eye width 0,20; interocular space 0,66; buccula widest anteriorly, narrowing to level of antenniferous tubercle, then narrow and tapering to about level of middle of eye, ending well before base of head; labium extending to between mesocoxae, first segment not attaining base of head, apex of third segment surpassing fore coxae; segment lengths from base: 0,44; 0,40; 0,36; 0,40; antennae with sparse semi-erect pilosity, first segment just exceeding apex of clypeus, segment lengths from base: 0,24; 0,50; 0,44; 0,52.

Pronotum clothed with sparse appressed hairs, most dense anterior to callosities, moderately punctate, distance between punctures from less than to 3 times diameter of a puncture, midline not impunctate, lateral margins nearly straight,

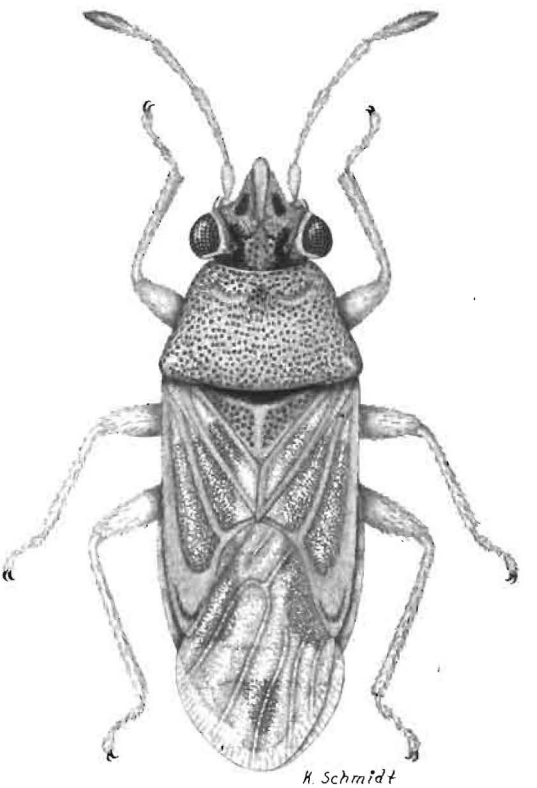

Fig. 4. *Hyalonysius gilvus* spec. nov. Dorsal view.

anterior and posterior angles lightly rounded, length 0,82; width 1,34. Scutellum with vestiture like pronotum, densest basally, punctate as pronotum, Y-shaped carina tumid, not sharply defined, transverse arms widely spread; length 0,58; width 0,78 mm.

Hemelytra slightly exceeding abdomen, clavus and corium sparsely clothed with fine appressed hairs, most evident on hyaline areas, with very few erect hairs projecting laterally along base of costal margin; veins barely evident, branch R of R + M obscured in opaque area; length of claval commissure 0,34; length of corium 1,80; membrane slightly wrinkled longitudinally, veins transparent, basal length to level of corial apex 0,78; apical length from level of corial apex 0,98 mm. Length: holotype male, 4,11 (male mean 3,96, range 3,89–4,11; female mean 4,42; range 4,39–4,44 mm).

Colour. Head with vertex light reddish brown; clypeus, margin of eyes pale yellow, small area around ocellus black except laterally. Pronotum pale yellowish brown, callosities light reddish brown; scutellum light reddish brown, basally (anterior of Y-carina) black, stem of Y-carina posteriorly pale yellow. Hemelytra with hyaline portions clear, without pigmentation, opaque portions pale yellowish brown, mem-

brane colourless, vestiture nearly white, inconspicuous. Connexivum pale yellow. Legs pale yellow with typical orsilline femoral spots light brown. Ventor pale reddish brown, with anterior and posterior margins of prothorax, anterior margin of mesothorax, posterior margins of metathorax, and complete acetabulae, scent gland auricle, evaporative area, and buccula pale yellow.

MATERIAL EXAMINED. Holotype male, SOUTH AFRICA, Cape Province: Ceres, April 1925 (R. E. Turner), in British Museum (Natural History). Paratypes: 4 males, 2 females, same data as holotype; 2 females, same data but xi.20; 1 female, same data but ii.21; 1 male, same data but 2/21.iii.21; 1 female, same data but iii.25. In British Museum (Nat. Hist.) and the authors' collections.

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Manuscript received 4 July 1975.